

NOTES ON THE NATIVE FLORA OF NEW SOUTH WALES.

BY R. H. CABBAGE

PART i.—THE TUMBARUMBA AND TUMUT DISTRICTS.

These notes were taken in March, 1903, when the effects of the drought were to be seen on every side, consequently only the conspicuous members of the flora were noticed.

Perhaps the chief feature brought out in this paper is the regulating influence which elevation exercises over the vegetation. Starting from Wagga Wagga, at an altitude of about 600 feet above sea-level, an ascent is made through Tumbarumba to Laurel Hill, where the height is about 3,300 feet. During this ascent, the flora changes absolutely, scarcely a plant being found at the latter place, which is also common to the low land. After travelling northerly for about 25 miles from Tumbarumba, a descent is made to Tumut (900 feet), which is reached at about 40 miles, and in this descent, and also that continued to Gundagai (750 feet), a return is made to the same warm-country flora as that of similar levels to the south-west.

Probably the tree which most definitely marks the dividing line between the warmer- and colder-country floras is the White Box, *Eucalyptus hemiphloia* var. *albens*, Miq., the upper margin of its habitat, when met with in a descent from the mountains, being an undoubted sign of an approaching warmer temperature, and in a given latitude the presence or absence of this tree on the western slopes at once supplies the observer with an approximate idea of the elevation. In following this species northerly a splendid example is seen of the warmer effects of northern lati-

tudes, for while in the southern district now described, the White Box is chiefly found below an elevation of 1,300 feet above sea-level, on the northern part of New England it is not uncommon at altitudes exceeding 2,000 feet.

From Wagga Wagga to Tumbarumba, viâ Kyamba, is a distance south-easterly of about 70 miles, and along the first part of the road the country has been considerably cleared, many plants having probably disappeared altogether; and it seems quite possible there may be numerous tracts of cleared country denuded of plants, without any record of their existence in the locality ever having been noted. For about 30 miles the ascent is slight, and the trees belong for the most part to the forms usually found in the low country, but gradually give place to those which occupy areas on the western slopes, and these again are replaced, in many instances on the higher altitudes near Tumbarumba, by the high cold-country flora.

During the first 10 miles the only trees noticed from the road were:—*Eucalyptus rostrata*, Schl. (River Red Gum), *E. melliodora*, A. Cunn. (Yellow Box), *E. Woollsiana*, R. T. Baker (Black or Narrow-leaved Box), *E. hemiphloia*, var. *albens*, Miq. (White Box), *Casuarina quadrivalvis*, Labill. (She-oak or Mountain Oak), *C. Cunninghamiana*, Miq. (River Oak), *Acacia decora*, Reichb., and *Callitris robusta*, R. Br. (White or Murrumbidgee Pine).

From the 10-mile post to about the 30-mile post near Kyamba the following were noted:—*Eucalyptus melliodora*, *E. hemiphloia* var. *albens*, *E. rostrata* (along the creeks), *E. Bridgesiana*, R. T. Baker (Apple; recognised as *E. Stuartiana*, F.v.M., by Deane & Maiden), *E. Woollsiana*, *E. polyanthemos*, Schau. (Red Box), *E. tereticornis*, Sm. (Forest Red Gum), *E. macrorrhyncha*, F.v.M. (Stringybark), and a few trees of *Acacia dealbata*, Link (Silver Wattle).

It was only near Kyamba that the Red Box and Stringybark began to make their appearance. The trees of *E. polyanthemos* had box bark on the trunk and branches, and in this respect exactly resembled the Victorian trees of this species, though the leaves of the Kyamba Red Box were less glaucous and scarcely

so orbicular. A few were found growing on the flat land, but their home seemed to be on the hills. Some were 50 feet high, with a diameter of 4 feet in a few instances.

In comparing these trees with the Victorian and Bathurst Red Box, they appear to more nearly resemble the former, but this is chiefly owing to their having box bark covering the trunk and limbs. The fruit might belong to either, while, from a cursory examination, the red timber of all three appears the same. In foliage, however, the Kyamba trees closely resemble the Bathurst Red Box, which has been described by R. T. Baker under the name *E. ovalifolia* (these Proceedings, 1900, p. 680). The line of demarcation, which may readily be noted in the field, between the Victorian and Bathurst Red Box, is that the former has in general fairly large, orbicular, somewhat coriaceous leaves, and a box bark on trunk and branches; while the latter has oval to lanceolate leaves, and a smooth gum-tree bark except for a few feet near the base where it is flaky and somewhat of the nature of box bark. But in investigating the Red Box from Kyamba towards Tumberumba, and again at Tumut, it was often found impossible to satisfactorily determine where a particular form should be placed, for while the former had the Victorian bark and the Bathurst foliage, those on the Gilmore side of Tumut were not constant as regards the bark, some having box bark all over the trunk, while that of others was chiefly smooth, but all had the foliage of the Bathurst trees rather than that of the Victorian. On the north side of Tumut, however, they were for the most part typical Bathurst Red Box both in bark and foliage, and the species throughout the district was known as Round-leaf Box or Round-leaf Gum. It would be a work of very great botanical interest to study any changes that may take place in these trees over the area extending from Tumut to Albury, having in view the question as to whether there are two distinct species in this locality or only one. For previous remarks concerning this species, see these Proceedings, 1902, p. 571.

After leaving Kyamba the ascent is considerable, and the change of vegetation is immediately noticed. A stunted form of

Eucalyptus tereticornis at once appears on the granite hills. It is apparently var. *dealbata*, but the fruits, though truncate, are more pedicellate than usual for this form.

E. hemiphloia, var. *albens*, continues for a few miles, but soon finds the elevation too cold.

Other Eucalypts noticed at intervals along the roadside were:—*E. macrorrhyncha*, *E. polyanthemos*, *E. Cambagei*, Deane & Maiden (Mountain Apple), *E. hæmastoma*, var. *micrantha*, Benth. (resembling *E. Rossii*, Baker & Smith; Brittle Gum), one small patch of *E. sideroxyylon*, A. Cunn. (Ironbark, on sedimentary formation above Kyamba), *E. camphora*, R. T. Baker (*E. Gunnii*, var. *ovata*, Deane & Maiden), *E. Bridgesiana*, *E. melliodora*, *E. rubida*, Deane & Maiden (*E. Gunnii*, var. *rubida*, Maiden, White Gum), *E. coriacea*, A. Cunn. (Cabbage Gum), *E. amygdalina*, Labill. (Peppermint, the first being seen near the 22-mile post from Tumbarumba), *E. maculosa*, R. T. Baker (*E. Gunnii*, var. *maculosa*, Maiden, White Gum), *E. stellulata*, Sieb. (Sally or Sallow, the first being near 13-mile post), and *E. dives*, Schauer (Messmate, at about 2 miles from Tumbarumba).

Seedling plants of *E. rubida* were noticed growing among those of *E. Bridgesiana*; and presented considerable similarity through both having orbicularly shaped glaucous leaves. By a little inspection it was found that in plants of equal height (about two to three feet), the former were paler in colour, had opposite and larger leaves as well as smooth stems; while the latter had rough stems, leaves rarely strictly opposite, and often slightly crenulate.

Other trees and shrubs noticed along this road were:—*Sterculia diversifolia*, G. Don (Currajong), *Leptospermum scoparium*, Forst. (10 feet high, with pointed leaves), *Xanthorrhœa* sp. (Grass Tree), *Exocarpus cupressiformis*, Labill. (Native Cherry), *Acacia dealbata* and *A. implexa*, Benth.

The Currajong all through looked healthy and green, and in this district, as well as elsewhere, fully demonstrated its drought-resisting qualities.

The most of the Eucalypts seen within about 30 to 40 miles of Tumbarumba are those which might be found in a similar zone

in the Bathurst to Goulburn district, the condition of temperature evidently being an important factor in regulating the distribution.

E. camphora, R. T. Baker (*E. Gunnii* var. *ovata*, Deane and Maiden, these Proceedings, 1901, p. 136), which is known as Swamp Gum or Broad-leaved Sally, was found only along the banks of creeks or extending out on the damp flats. It has a thick, hard, flaky bark for 6 or 8 feet near the butt, then thin strips toning off into smooth of a greenish or slaty colour. Usually the trees may be said to average from 30 to 40 feet high with a diameter from one to two feet. The timber is considered to be of little value, but lasts fairly well in damp places as compared with other local timber. The foliage of this species in the Tumbarumba district is of a dark healthy-looking green colour; the young leaves are often nearly orbicular, while the mature ones, though generally more elongated, are broad and mucronate. The fruits throughout this district are short and conical, with exerted valves. This species is often associated with *E. stellulata*, and shows considerable affinity to *E. acervula*, Miq. (*E. Gunnii* var. *acervula*, Deane and Maiden; *E. paludosa*, Baker), but is generally separable from it both by fruits and foliage. No trees of the latter were seen in the Tumbarumba or Tumut districts, but *E. camphora* was common along most of the creeks on the higher parts.

A tree growing in the Tumbarumba district, though not noticed close to the road travelled, is *E. globulus*, Labill., the Tasmanian Blue Gum, locally known as Eurabbie. It is locally considered one of the best of these cold-country timbers, but those who are acquainted with timbers of other districts look upon it as very variable in quality and of doubtful value. Tumbarumba is one of the few spots in which it is indigenous in New South Wales.

From Tumbarumba to Laurel Hill (also known as Bago) is northerly about 15 miles, and for the most part a gradual ascent. The Eucalypts to be found near the road are:—*E. dives* (only near Tumbarumba), *E. camphora*, *E. Bridgesiana*, *E. amygdalina*, *E. stellulata*, *E. rubida*, *E. coriacea*, *E. viminalis*, Labill., and *E. delegatensis*, R. T. Baker (Mountain Ash).

E. globulus may be found a few miles above the road near Back Creek, and *E. viminalis*, growing as large white gum trees, occurs on the basalt tableland all around Laurel Hill. The latter species is confused locally with *E. rubida*, and except for the round "sucker" leaves of *E. rubida* and its patches of reddish bark often noticeable towards the end of summer, the general difference between these two trees is not pronounced.

E. delegatensis frequents the heads of most of the gullies throughout the Bago forest reserve, extending thence across towards Kiandra, and occurring, among other places, on the Delegate Mountain, near the little township of Delegate, as its botanical name suggests. It is the most valuable timber tree in the neighbourhood of Bago, being cut in sawmills for transport to adjacent towns. The trees are large, being commonly 150 feet high with a diameter of 5 feet. The bark for half-way up the barrel is fibrous, approaching a stringybark, but the upper part of the trunk and the branches are smooth, except for the long ribbons or streamers of bark which are often suspended therefrom. The leaves are large and fairly coarse, especially those on seedling plants about 10 or 12 feet high, where measurements up to 8 or 9 inches long by half that in width are common. A favourite spot for the germinating of the seeds is where the earth has been disturbed by the burrowing of the Wombats (*Phascotomys* sp.), which are common in this locality. Seedling plants of this species appear to pass out of the opposite-leaved stage at a very early period, more so than is the case in the majority of species of this genus. The "sucker" leaves appeared to be less frequent on Mountain Ash than on any other in the locality, and those noticed had no marked characteristics, and were much smaller than the leaves of seedling plants a few feet high. The fruits somewhat resemble those of *E. Sieberiana*, F.v.M., the Mountain Ash of the coastal area, but appear to be regularly more constricted at the rim. The venation of the leaves of these two trees also shows considerable similarity, and this, together with the resemblance of the fruits, suggested the thought that *E. delegatensis* might only be a variety of *E. Sieberiana*.

The differences, however, between these two trees, especially in the bark, seem sufficient to warrant their being considered specifically distinct. Some general characters, however, such as bark (partly), foliage, and in some cases the fruits, suggest a considerable affinity with *E. obliqua*, L'Héritier.

The timber of *E. delegatensis* is fissile, easily worked, and used for all kinds of structures, but is not considered very durable in the ground. Although it is used in the framework of buildings, the blocks upon which it stands are selected in the Bago district from healthy trees of Peppermint (*E. amygdalina*), though in no other part of this State have I known the latter species to be specially recommended for its durability under ground, and am inclined to think that its value here is of a comparative nature. This Mountain Ash evidently produces a timber which requires to be well seasoned, otherwise it shrinks very much. The floors of verandahs and balconies in the towns of Adelong and Tumut give evidence of the shrinkage which takes place in the flooring boards, the cracks between them in many instances being more than a quarter of an inch across.

In the Tumbarumba to Laurel Hill district it is *E. amygdalina*, which is known as Peppermint, and *E. dives* as Messmate, though this order is reversed in other parts of the State. No trees of the latter species were seen near Laurel Hill, but it was noticed that some bushmen called all the small trees of *E. amygdalina* Peppermint, while some of the large ones were pointed out as Messmate, thus showing that even local knowledge must sometimes be received with caution.

One resident of Laurel Hill informed me that goats would eat the "sucker" leaves of all the local Eucalypts except those of *E. amygdalina*, and some trees which he ringbarked near his residence were kept "suckered" in this way till they died, but the Peppermints were allowed to remain untouched.

A feature in connection with the vegetation of Laurel Hill, which is about 3,300 feet above sea-level, is its resemblance to that of parts of Tasmania, and this is owing for the most part to the similarity of climate. The geological formation of the locality

is chiefly granitic, covered in places with basalt flows, underneath which mining for alluvial gold is being carried on.

Among the various plants which may be found in the neighbourhood are:—*Clematis aristata*, R.Br., *Hibbertia linearis*, R.Br., var. *obtusifolia*, *Drimys aromatica*, F.v.M. (Pepper Bush), *Oxylobium ellipticum*, R.Br., var. *alpinum*, Maiden & Betche, *Daviesia latifolia*, R.Br. (Hop Scrub), *D. ulicina*, Sm., *Pultenaea mucronata*, F.v.M., *Platylobium formosum*, Sm., *Acacia siculiformis*, A. Cunn., *A. dealbata*, Link (Silver Wattle), *A. melanoxyton*, R.Br., *A. lunata*, Sieb., *Baeckea Gunniana*, Schau., *Leptospermum lanigerum*, Sm., *Callistemon pithyoides*, Miq., a much divided, narrow-leaved form of *Panax sambucifolius*, Sieb., *Loranthus* sp., *Coprosma Billardieri*, J. Hk., *C. hirtella*, Labill., *Olearia myrsinoides*, Labill., *O. floribunda*, Benth., *Cassinia aculeata*, R.Br., *Bedfordia salicina*, DC., *Wahlenbergia gracilis*, Schrad. (Blue Bell), *Epacris heteronema*, Labill., *Veronica Derwentia*, Andr. (erroneously called Wild Tobacco), *Prostanthera lasianthos*, Labill., *Persoonia Chamæpeuce*, Lhotsky (Geebung), *Hakea microcarpa*, R.Br., *Lomatia longifolia*, R.Br., *Pimelea ligustrina*, Labill., var. *glabra*, Maiden & Betche, *Exocarpus cupressiformis*, Labill. (Native Cherry), *E. stricta*, R.Br., *Lomaria discolor*, Willd., *L. alpina*, Spreng., *L. Capensis*, Willd., and *Aspidium aculeatum*, Sw.

The last four species mentioned do not comprise the whole of the ferns found in this locality.

Acacia melanoxyton, with its dense foliage, is conspicuous in the heads of the gullies and near the streams, being known locally as Hickory.

During a limited search no species of *Grevillea* was noticed throughout the Tumbarumba district. The genus is one which apparently does not favour a cold climate, as only one species, *G. australis*, R.Br., is recorded for Tasmania. This species is also recorded from the elevated parts of Victoria and from Mount Kosciusko.

In driving from Laurel Hill to Batlow the following trees and shrubs were noticed on the roadside:—*Eucalyptus viminalis*, *E.*

rubida, *E. amygdalina*, *E. coriacea*, *E. camphora*, *Cassinia aculeata*, *Daviesia latifolia*, *Acacia implexa*, Benth., *A. dealbata*, *A. melanoxydon*, *Exocarpus cupressiformis*, *E. stricta*, *Leptospermum lanigerum*, *L. scoparium*, *Platylobium formosum*, *Indigofera* sp., *Cassytha* sp., *Loranthus* sp., *Bedfordia salicina*, and *Prostanthera lasiantha*.

Undoubtedly this last-named shrub is well worthy of cultivation in a cool climate, for towards midsummer it becomes covered with a profusion of beautiful flowers of a whitish hue often tinged with blue. It blooms luxuriantly in Tasmania and the cooler parts of Victoria, coming up along the south coast and highlands of this State. At Ulladulla it is sometimes called White Christmas-bush, to differentiate it from *Ceratopetalum gummi-ferum*, Sm., the well known Pink Christmas-bush.

Between Batlow and Adelong the country falls considerably, and it may be noticed that the same zone of trees is passed through that was found away to the south-west when ascending to Tumbarumba from Kyamba, and which exists along the greater part of the western slopes, forming a connecting link between the flora of the lowlands and that of the mountain ranges. The Eucalypts noticed were:—*E. camphora*, *E. amygdalina*, *E. rubida*, *E. viminalis* (these were seen only on the higher part of the road near Batlow), *E. Bridgesiana*, *E. macrorrhyncha*, *E. Cambagei*, *E. coriacea* (a few trees only, at a comparatively low level for this species), *E. dives*, *E. tereticornis* and var. *dealbata*, *E. hemiphloia* var. *albens*, and *E. melliodora*, the last two being only noticed towards Adelong.

E. polyanthemos was not seen along this road, although it is common in similar situations to the north and south. Possibly its absence may be accounted for by the fact that the geological formation between Batlow and Adelong is granitic, while this species usually prefers a formation of sedimentary origin. It occurs considerably, however, below Adelong near Mount Horeb, and scarcely differs from the Red Box of Bathurst.

Various shrubs and small trees growing by the roadside are:—*Bæckeia* sp., *Hibbertia linearis*, *Acacia melanoxydon*, *A. dealbata*,

Leptospermum scoparium, *Daviesia ulicina*, *D. latifolia*, *Cassinia aculeata*, *Bursaria spinosa*, Cav., *Exocarpus cupressiformis*, *E. stricta*, *Loranthus* sp., *Banksia marginata*, Cav., *Sterculia diversifolia*, and *Discaria australis*, Hook. This last-mentioned plant may be found among the rocks in clear fields, its sharp spines protecting it from being devoured by stock.

On the hillside south-westerly from Mount Horeb railway station, at about 8 miles from Adelong, are some trees of *Eucalyptus hæmastoma* var. *micrantha* (White or Brittle Gum), and judging from the white stems visible, they appear also to be distributed among the hills to the northward.

Between Adelong and Tumut the country is generally cleared, and the remaining species therefore comparatively few. The following Eucalypts, however, were noticed:—*E. Bridgesiana*, *E. melliodora*, *E. hemiphloia* var. *albens*, *E. tereticornis*, *E. macrorrhyncha*, *E. dives*, *E. rostrata* (on Gilmore Creek), and *E. polyanthemus*.

Desmodium varians, Endl., and *Glycine tabacina*, Benth., were found near Tumut. *Eucalyptus pulverulenta*, Sims, the Argyle Apple, may be found a few miles south-easterly from Tumut.

In going from Tumut towards Wyangle for a distance north-easterly of about 15 miles, the Eucalypts noticed were:—*E. rostrata* (near the Tumut River), *E. Bridgesiana*, *E. hemiphloia* var. *albens*, *E. melliodora*, *E. macrorrhyncha*, *E. polyanthemus* (chiefly known as Round-leaf Gum), *E. tereticornis*, *E. Cambagei* (some with very large flowers and fruits), *E. dives*, *E. amygdalina*, *E. rubida*, *E. viminalis*, *E. coriacea*, and *E. camphora*.

A casual glance over this list will at once reveal the fact that the country passed over must be rising from Tumut to Wyangle, as the species mentioned from *E. dives* onward are all cold-country trees, and are very rarely found growing among such as *E. rostrata* or var. *albens*. At the same time the connecting links between the warm- and cold-climate floras may be found represented by *E. polyanthemus*, *E. macrorrhyncha*, and *E. Cambagei*. This climatic influence is a feature worthy of great consideration in connection with questions of forestry.

Other trees and shrubs noted towards Wyangle were *Hibbertia linearis*, *Bursaria spinosa*, *Sterculia diversifolia*, *Pomaderris* sp., *Acacia implexa*, *A. melanoxyton*, *A. dealbata*, *A. pravissima*, F.v.M., *Leptospermum scoparium*, *Banksia marginata*, *Casuarina quadri-valvis*, *Exocarpus cupressiformis*, and *Xanthorrhœa* sp. (Grass Tree).

Between Tumut and Gundagai the country is naturally an open forest, much of which has been cleared, consequently the flora is very sparse. Among the species seen from the coach were:—*Eucalyptus rostrata*, *E. Bridgesiana*, *E. melliodora*, *E. macrorrhyncha*, *E. hemiphloia* var. *albens*, *E. polyanthemos*, *E. Cambagei*, *E. tereticornis*, *Xanthorrhœa* sp., *Sterculia diversifolia*, *Bursaria spinosa*, *Wahlenbergia gracilis*, and *Casuarina Cunninghamiana* (River Oak).

The last-mentioned species was found only on the Murrumbidgee at Gundagai (though is probably on unobserved portions of the Tumut River as well), and although near the town most of the trees have been destroyed, it may be seen lining both banks of the river a few miles up stream. This species is common along the upper portions of most of our rivers, growing close to the water's edge, thereby outlining the course of the stream, and while its roots serve to preserve the banks from erosion during floods, its conspicuous dark green foliage contributes materially towards the general beauty of the landscape.

The complete list of Eucalypts seen between Wagga, Tumburumba, and Tumut gives a total of twenty-one, viz.:—*E. rostrata*, *E. melliodora*, *E. Woolfsiana*, *E. hemiphloia* var. *albens*, *E. Bridgesiana*, *E. polyanthemos*, *E. tereticornis* and var. *dealbata*, *E. macrorrhyncha*, *E. Cambagei*, *E. hæmastoma* var. *micrantha*, *E. sideroxyton*, *E. camphora*, *E. rubida*, *E. coriacea*, *E. amygdalina*, *E. maculosa*, *E. stellulata*, *E. dives*, *E. globulus*, *E. delegatensis*, and *E. pulverulenta*.

I have to acknowledge assistance from Mr. J. H. Maiden, F.L.S., in identifying some of the plants mentioned.